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STATE DOCUMENTS

REPORT OF THE  
MONTANA  
State Highway  
Commission



— BY —  
GEO. R. METLEN  
SECRETARY

—  
FOR THE YEARS 1915-1916

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STATE HIGHWAY  
COMMISSION

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FOR THE YEARS 1915-1916

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PERSONELL MONTANA STATE HIGHWAY COMMISSION

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A. W. MAHON	- - - - -	Chairman and Ex-officio Member
GEO. R. METLEN	- - - - -	Secretary State Highway Engineer
LEON D. CONKLING	- - - - -	Ex-officio Member
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CHAS. A. KYLE	- - - - -	Bridge Engineer
MARK H. HOPKINS	- - - - -	Draftsman
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A. S. BEARDSLEY	- - - - -	Cost Accountant With Convict Crew



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# REPORT OF THE Montana State Highway Commission

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Helena, Montana, December 1, 1916.

To the Honorable S. V. Stewart, Governor of Montana.

I beg leave to submit for your consideration the biennial report of the Montana State Highway Commission for the years 1915-1916.

Since the submission of the last report the activities of the State Highway Commission have grown to such an extent that the influence of the Commission today is evidenced throughout the state by better roads and a more economical expenditure of our road moneys.

Through the efforts of the Commission the purchase of various materials entering into road construction has been placed on an open competitive business basis, which has resulted in a marked reduction in prices. The Commission issues standard specifications for culverts and other steel products used by the various counties, and has placed a sufficient number of copies of all such specifications at the disposal of each board of county commissioners.

Bridge plans and specifications have been furnished the several counties and all important bridge construction has been carefully supervised by a representative of the Highway Commission. Investigations and surveys for bridges are executed, and examinations as to the safety and adequacy of existing structures are made whenever called for by a county.

The Commission has followed up the policy of purchasing tools and equipment for use of the convict crews employed upon the roads to the end that such work can be properly and economically carried out. The Commission has also superintended and directed the work.

Under the provisions of the motor registration law sufficient funds have accrued to the Highway Commission to carry on the administrative work of the Department, and also to admit of the purchase of equipment and machinery.

A state highway map has been published and circulated as required by law, and 15,000 copies of the same have been distributed during the past two years.

During the season of 1916 the Commission held meetings with practically every board of county commissioners in the state, at which meeting road construction and standard methods of road work were discussed with the county commissioners and road supervisors. The results obtained by these were very gratifying and proved to be of great benefit to the various counties in handling their road problems. These meetings also enabled the Highway Commission to gain first



hand information as to the road and bridge conditions in each community.

The Secretary of the Highway Commission has at all times complied with the wishes of the various road authorities and road organizations of the state, and has held meetings and consultations with them regarding road work whenever and wherever the occasion required.

Meetings have been arranged and instructions given as to results obtained from different kinds and classes of road appliances coming under the observation of the Commission. In many instances such meetings have been illustrated by lantern slides of the various kinds of road machinery in operation on Montana roads.

### BRIDGE DEPARTMENT.

The Fourteenth Session of the Legislature amended our road laws in such a manner as to require the Commission to furnish standard plans and specifications for all bridges hereafter constructed or repaired, the cost of which should exceed five hundred dollars.

Such a requirement was a very radical departure from the old system of allowing each bidder for bridge work to submit as many propositions as he might see fit, for a given bridge, furnishing his own plans and specifications, which to say the least were not drawn in any way that might prejudice the interests of the party submitting the bid.

Usually there were a number of bidders, each submitting from three to twelve different propositions. Owing to the utter lack of any technical knowledge of matters of this kind the contract was usually let to the contractor who claimed the territory by reason of some former job or whose proposition seemed to most nearly meet the money available.

This method resulted in the erection of a very large assortment of bridges with no uniformity as to loading or design and with no



*Standard 140 Ft. Span—One of Four, Musselshell County—Cost \$8,200.00.*

consideration as to the kind of traffic requirements which were to be met. After a contract was let plans and details were never checked by anyone representing the interests of the county. It was taken for granted that all bridge shops were strictly honest and that the designs were properly executed. At the same time the counties were paying prices that warranted the very best work possible, with no means of determining whether or not they were getting value received.

After investigating methods followed in other states the Commission organized the bridge department on June 1, 1915, having employed Mr. Charles A. Kyle, a structural steel designer of many years successful experience both in designing and building steel and concrete structures, as bridge engineer, and immediately began furnishing plans and specifications for all bridge work as called for by the several counties.

A very careful study was immediately started of traffic conditions peculiar to Montana roads, with particular attention to bridge requirements,—more particularly the effect of the loading carried on various vehicles, the kind, effect, weight of and frequency of livestock loads, automobile trucks, which are becoming a very destructive element, and not least, the heavy traction engines of various kinds in common use.

All data collected was carefully compared and tabulated to the end that standard bridges might be designed to meet conditions existing in Montana, particularly with reference to the most economical construction.

After carefully considering all data obtainable, as well as the question of how well to build to meet present conditions and to anticipate future requirements sufficiently far distant so that the bridges might not become inadequate for the ever-increasing weight of traffic loads before the end of a reasonable life of the bridge, probably thirty to forty years, it was decided that the standard load for all floor systems should be 100 pounds per square foot of surface, or a concentrated load due to a twenty-ton tractor or truck, two-thirds of the load carried on the rear wheels, each floor stringer to be designed to carry one-half of such wheel load.

In accordance with this decision standard specifications, with standard forms for advertising, and a standard form of bidding sheet, were published, and fifty copies were filed in the office of the county clerk of each county. In addition to the standard specifications standard plans for all small bridges and culverts were made and filed in each county. These standards are for small wood and steel beam bridges, pile bent bridges and culverts that do not require special checking or special plans for abutments, and usually cost less than five hundred dollars to build.

For all steel structures of a greater span than forty feet a standard truss design is used, riveted work being required for all spans up to 220 feet in length. It is found in a great number of cases where a high truss is used, that the Warren type of truss is the most economical for bridges having even numbers of floor panels,—that is, six, eight, ten



and twelve panel structures,—while a Pratt type of truss is used for all uneven panel structures. Low truss pony trusses are used on spans up to 120 feet in length.

It is deemed advisable to build all bridges upon duplicate plans as far as possible, all designed for the same standard loading, except in special cases where peculiar local conditions warrant the drawing of a special design. When such a situation arises special designs are furnished. However, the use of standard designs that are frequently constructed enables the bridge department to make close estimates as to prices for each structure. It also facilitates prompt delivery of materials, owing to the fact that the shops have the plans on hand that have already been checked and approved by the state bridge department and can therefore immediately proceed with the construction of an additional order.

Different bridge crossings may use the same form of truss for a given length of bridge, but foundations, abutments and piers are of necessity different in each instance. A general plan for standard piers and abutments is provided, but they must be altered to fit each individual case as to height and foundation conditions. A county desiring to construct a bridge is required to furnish the secretary of the Highway Commission with a profile of the proposed crossing with all data obtainable as to length of span or spans, height of banks, highwater, low water, floor height, location of gravel for concrete, name of nearest shipping point and distance of same from bridge site. Upon receipt of this information, if the data furnished appears sufficiently reliable, plans are immediately furnished. If conditions exist requiring further investigation, a careful survey is made by the bridge department, soundings and borings made if necessary to the end that the bridge may be properly constructed in the most economical manner.

All plans are furnished direct to contractors from the Commission's



*Concrete Bridge, Brown's Gulch, Silver Bow County.*



office at Helena, and a sufficient supply to meet all needs furnished the county clerk of the county asking for bids.

After a contract is let the construction of the bridge is supervised by the state bridge department. If it is considered necessary a man is kept on the ground during construction to insure a fulfillment of all terms of the contract.

At the completion of the bridge the same is carefully examined by a bridge expert before final acceptance and before authorization for payment is made. Upon the acceptance of the bridge by the Commission a tablet is placed on each end, showing the bridge to be a State Highway standard having a capacity of twenty tons.

The results of this system have been very satisfactory. All bids are made upon the standard bidding sheet, making it possible for the commissioners to tabulate the bids submitted and determine the low bidder without argument.

All prospective bidders can obtain plans in ample time to allow of an examination of the bridge site. This stimulates a keen competition, as each and every bidder is given opportunity to make investigations, and each bid is made upon exactly the same basis.

Contract prices during the last two years for bridges built according to the requirements of Highway Commission standards have been no greater, and in many cases less, than those previously paid for structures of similar length, notwithstanding a large advance in price of all raw material, while in all cases the structures built under Highway Commission standards are very much heavier than those heretofore erected.

The counties generally have heartily co-operated in every way to make the new system a success. However, in a few instances boards of county commissioners have evaded the law and let contracts for bridges without giving any opportunity for competition, and for structures far below the standard required to meet present day conditions, while in



122.5 Ponytruss, Missoula County—Cost \$4,680.00.

a few instances contracts have been let privately for structures containing material far in excess of that required for proper strength. In such cases the work is constructed without proper supervision, and on plans and specifications furnished by the contractor. No check is made of the strain sheets (in some cases no strain sheets are furnished), nor are the shop details ever calculated to insure the proper proportioning of the various members to meet the stresses called for. The bridge law should be so amended as to clearly prevent such practice.

The following standard designs have been prepared and are on hand.

#### BEAVERHEAD COUNTY

Kind of Bridge.	Spans.	Total Length.	Near.	Stream.
Steel	1-112'	112'		Beaverhead river
"	1-120'	120'		" "
"	1-122'6"	122'6"		" "
"	1-175'	175'	Brown's	Big Hole river
"	1-175'; 1-75'	250'	Dickey	" "
" (chkd)	1-90'	90'		Beaverhead river
"	1-175'	175'	Squaw creek	Big Hole river
"	1-42'	42'	Brown's	" "
"	1-75' part of	75'		" "

#### BIG HORN COUNTY

"	1-80'	80'		Little Horn river
Pile	2-16'	32'		Fly creek

#### BLAINE COUNTY

Steel	1-140'	140'	Coburg	Milk river
"	1-175'	175'	"	"

#### CARBON COUNTY

"	1-42'	42'	Red Lodge	Red Lodge creek
Pile	3-15'	45'	"	" "
Steel	3-75'	225'		Clark's Fork

#### CHOUTEAU COUNTY

" (chkd)	1-180'	180'	Carter	Teton river
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#### CUSTER COUNTY

"	1-120'	120'		Sunday creek
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#### DAWSON COUNTY

Steel	1-100'	100'	Circle	West Fork Milk
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#### DEER LODGE COUNTY

Steel	1-175'	175'	Squaw Creek	Big Hole river
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#### FALLON COUNTY

"	1-100'	100'		Little Missouri
"	1-75'	75'		Beaver creek
"	1-75'	75'		Little Beaver creek
Steel & Pile	1-120' 8 bents	240'		O'Fallon creek

## FERGUS COUNTY

Steel (chkd)	1-75'	75'	Hobson
" "	1-50'	50'	

## GRANITE COUNTY

Steel	2-115'6"	232'	Rock Creek	Hellgate river
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## HILL COUNTY

"	1-72'	72'		Willow creek
"	"	"		" "

Checked

Combination	2-80'	160'		Big Sandy creek
Steel	1-100'	100'		West Fork Milk
"	"	"		" "

## LEWIS AND CLARK COUNTY

Concrete	1-18'	18'	
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## MADISON COUNTY

Steel	1-175'	175'	Brown's	Big Hole river
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## MISSOULA COUNTY

"	2-115'6"	232'	Rock Creek	Hellgate river
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## MUSSELSHELL COUNTY

"	1-140'	140'	Ryegate	Musselshell river
"	1-140'	140'	Absher	" "
"	"	"	Delphia	" "
"	"	"	Burgoyne	" "
"	1-175'	175'	Absher	" "
"	1-122'6"	122'6"	Gage	" "
"	"	"	Waldheim	" "
"	"	"	Elso	" "



Standard 122.5 Ft. Span—One of Three, Musselshell County—Cost \$7,380.00.



## MINERAL COUNTY

"	1-85'	85'		St. Regis river
"	1-140'; 1-175'	315'	Alberton	Clarks Fk. Missoula
"	2-28'; 1-140'; 1-175'	371'	"	" "
"	1-175'; 2-140'	455'	St. Regis	Clarks Fork
"	2-210'	420'	St. Regis	" "

## PHILLIPS COUNTY

Pile	8-16'	128'		Alkali creek
Steel	1-60'	60'	Malta	"
Steel & Pile	1-120'; 8-15'	240'		"
Steel	1-85'	85'		"

## PRAIRIE COUNTY

"	1-175'	175'	Fallon	O'Fallon creek
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## RAVALLI COUNTY

Steel	2-120'	240'		Bitter Root river
"	1-160'	160'	Como	" "
"	1-220'	220'	Florence	" "
"	alternate design			
	1-240'	240'	"	" "

## SANDERS COUNTY

(Wood) Log	2-30'; 1-42'	102'		Bull river
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## SHERIDAN COUNTY

Pile	2-16'	32'		
Steel 1	1-30'	30'		
Steel 1	1-30'; 1-85'	115'		E. Poplar creek
Steel	3-60'		Medicine Lake	Big Muddy creek
"	1-72'	72'		" "
"	1-75'	75'		Milk river
"	1-112'	112'		Poplar creek

## SILVER BOW COUNTY

Concrete	1-32'	32'	Gregson	Silver Bow creek
"	"	"		Brown's Gulch
Steel	1-75'; 1-175'	250'	Dickey	Big Hole river
"	1-75' part of 75'			" "

## VALLEY COUNTY

"	1-80'; 1-21'	101'		Beaver Creek
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## CULVERTS.

During the seasons of 1913 and 1914 the Commission started investigations as to prices paid for metal culverts used by the several counties, to determine if prices paid for such appliances were in excess of what should be a legitimate charge for the same. It was found that a wide variation of prices was being paid in the different counties for the same



material. The details of this investigation were fully shown in the 1914 report.

These investigations were further pursued during the seasons of 1915 and 1916, with the object of determining if possible the relative superior merit, if any, of several trade mark irons and steel offered for sale in the state.

Ungalvanized samples of several metals employed in construction of culverts offered for sale in the state were procured. These were all carefully weighed and marked for future identification and then buried in damp alkaline soil, such as is encountered on any of our roads.

At the end of fourteen months the test pieces were taken up, all rust and scale thoroughly cleaned off, and loss due to corrosion carefully determined by reweighing each piece.

All samples showed a remarkable uniformity in deterioration, the loss in weight for nine different test pieces being as follows:

No. 1.	"Fort Dodge 99.90" showed a loss of.....	14.30%
No. 2.	"Fort Dodge 99.90" showed a loss of .....	14.80%
No. 3.	"American Sheet & Tinsplate," Vandergriff works, showed a loss of .....	15.00%
No. 4.	"Portsmouth Iron" showed a loss of.....	15.3 %
No. 5-1.	"Keystone Metal" showed a loss of.....	15.9 %
No. 5-2.	"Keystone Metal" showed a loss of.....	16.2 %
No. 6-1.	"American Ingot Iron" showed a loss of.....	15.6 %
No. 6-2.	"American Ingot Iron" showed a loss of .....	15.2 %
No. 7.	"Vismara Metal" showed a loss of.....	15.4 %

Thereupon the samples were again buried in damp soil. After the elapse of eleven months' time they were again taken out, cleaned and reweighed, with the following results:

No. 1	showed a total loss in weight of.....	43.6%
No. 2	" " " " .....	44.1%
No. 3	" " " " .....	43.4%
No. 4	" " " " .....	42.3%
No. 5-1	" " " " .....	44.9%
No. 5-2	" " " " .....	45.3%
No. 6-1	" " " " .....	45.2%
No. 6-2	" " " " .....	41.6%
No. 7	" " " " .....	40.1%

The total losses in weight of the various samples tested as shown by the table above, ranged between 40.1% to 45.3%, in twenty-five months.

Galvanized samples of each of the above brands of metal were given the same treatment or test, but none showed any appreciable loss of weight.

The above test demonstrated the fact that any unprotected sheet iron would rapidly corrode when exposed to an alkaline soil, if not coated with some protective material that would resist oxidization.

The conclusion drawn from the test was that there was not enough difference shown in corrosive-resisting properties between the various

brands of metals tested to warrant the selection of any particular brand as advantageous over the other.

Standard specifications were thereupon drawn for the purchase of culverts by the various counties and an ample supply furnished each county clerk for use of the county in awarding contracts. Additional copies are furnished at all times whenever required.

These specifications require all prices submitted to be upon a pound basis.

This eliminates the substitution of lighter gauge metal, and at the same time settles the question of whether the diameter of a culvert should be measured from outside or inside of corrugations, as it is plainly seen that there will be no changes in gauges or diameters when the metal is paid for by the pound rather than by the foot of length of finished culvert.

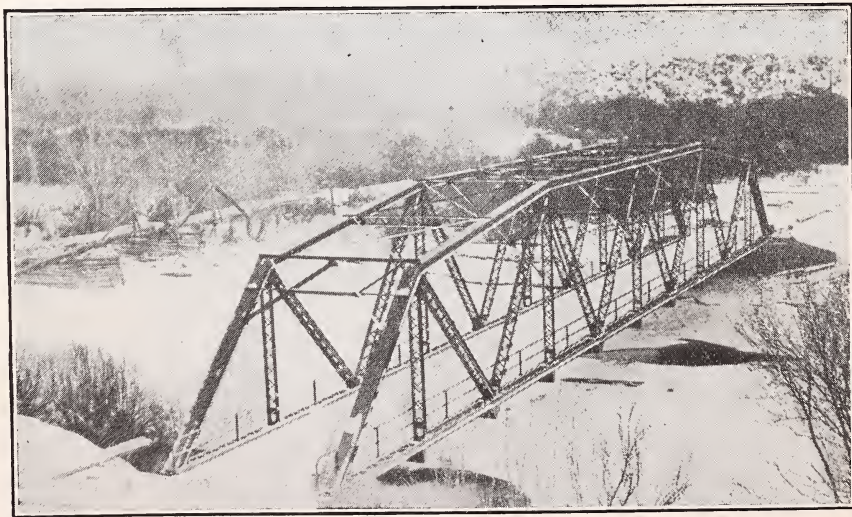
The specifications are so drawn as to allow all manufacturers to submit bids in accordance with the specifications, no objections being made to the purchase of any trade mark, patented or proprietary material, in open and actual competitive bidding at the same or less price for which an unpatented article equally suitable and in accordance with the specifications can be purchased.

### FEDERAL AID.

On July 11, 1916, the President signed what is known as the Shackleford-Bankhead Federal Aid Road Act, thereby making the same a law of the United States.

Under the provisions of this law the United States will spend for road improvements in the several states during the ensuing five years seventy-five millions of dollars.

The apportionment accruing to Montana under the law will be for the ensuing five years approximately \$1,500,000.00, for use outside of forest reserves, and under what is termed Section 8 of the measure,



*Standard 175 Ft. Span, Brown's, Beaverhead County—Cost \$8,500.00.*



approximately \$70,000.00 per annum for a period of ten years for roads within forest reserve districts within the state.

The initial allotment for the year 1916-17 will be \$98,287.19 federal aid, and \$69,901.00 forest aid, or a total of \$168,113.19 available for road construction during the season of 1917. The allotments will be increased each successive year, Montana probably receiving \$200,000 for the second year, \$300,000 for the third year, \$400,000 for the fourth year and \$500,000 for the fifth year.

The law provides that this money can be expended under the direction of the Department of Roads, a sub-division of the Department of Agriculture.

It is provided that the states must meet the appropriation with a like amount, that is on a basis of 50 per cent each; and that the money can only be expended through the medium of a state highway department, which must make all necessary surveys, plans, specifications and superintend the construction, subject to approval of the Federal Department of roads.

The Department of Roads, in order to get first hand information as to conditions in the various states called a meeting of all state highway department heads at Washington, D. C., on August 16, 1916.

Montana was represented at this conference by George R. Metlen, Secretary of the State Highway Commission.

At this meeting the federal aid law was fully discussed and the various provisions explained in detail by federal officers. The state representatives were given an opportunity to express their views as to the probable working of the law in their respective localities.

The Department presented a set of rules and regulations which were discussed in detail and amended upon the suggestions of the state officials wherever it was shown necessary in order to obtain a practical mode of procedure that would not work a hardship upon any particular state.

Each representative was given an opportunity to discuss his particular case with the federal officials at a meeting held exclusively for his benefit. At such a meeting Montana's situation was presented.

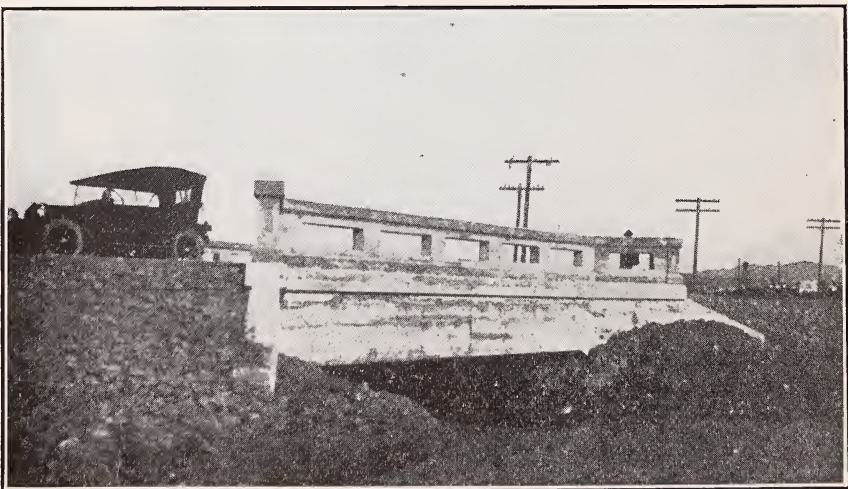
It was indicated by the federal officers that the policy of the government would be to expend money only on the through connecting tonnage post roads. It was very emphatically stated that this appropriation could not be expended on side roads or projects remote from trade centers and that improvements should begin at city limits, working away from the same. It was stated that the projects would be limited to the smallest possible number in each state, and that preferably Montana should have but two at the outset, which would make each project approximately \$100,000.00.

Owing, however, to the difficulty of obtaining the required 50 per cent co-operation in sums of this size, it was proposed that we initiate five projects of \$40,000 each, it being Mr. Metlen's belief at that time that

such projects could be financed by the counties through which the roads might run.

Each state was required to submit a tentative road plan, showing the roads upon which it is proposed to expend federal aid money. In accordance therewith the Montana Highway Department submitted maps showing the following roads for improvement: An east and west road, following the line of the Northern Pacific Railroad from the eastern entrance of the state at Yates, to Heron, on the western line of the state; an east and west road following approximately the line of the Northern Pacific from Missoula to the Idaho line east of Wallace, Idaho; an east and west road following the line of the Chicago, Milwaukee & St. Paul Railroad from Terry to the eastern boundary of the state near Baker; an east and west road following the line of the Great Northern Railroad from the east line of the Blackfoot Indian Reservation to Glasgow, thence north to the northern boundary of the Fort Peck Indian Reservation, and easterly from near the town of Opheim to Scobey, thence to Plentywood, thence southerly to the line of the Great Northern near Culbertson, and thence east to the Montana line at Mondak; a north and south road between Glendive and Fairview; a north and south road from the Montana line south of Red Lodge to Laurel, north from Billings to Roundup, thence to Lewistown, thence to Great Falls, thence to the eastern boundary of the Blackfoot Indian Reservation near Cut Bank; a north and south road entering the state at Monida following approximately the line of the Oregon Short Line Railroad to Butte, north from Butte approximately along the line of the Great Northern to Helena, Great Falls and on to Havre; a north and south road from Hamilton to Missoula, thence to Kalispell, thence west to Troy; an east and west road from Three Forks to Helena and thence to Garrison. These roads total about 2,200 miles in length.

A copy of the federal aid law and the rules and regulations are herewith submitted.



32 Ft. Concrete Trestle, Silver Bow County—Cost \$8,650.00.



## Rules and Regulations of the Secretary of Agriculture for Carrying Out the Federal Aid Board Act.

(EXCEPT SECTION EIGHT THEREOF)

### Regulation 1. Definitions.

For the purposes of these regulations, the following terms shall be construed, respectively, to mean—

Section 1. **The Federal Aid Road Act, or the Act.** An act of Congress entitled "An Act To provide that the United States shall aid the States in the construction of rural post roads, and for other purposes," approved July 11, 1916 (Public—No. 156—64th Congress).

Sec. 2 **The Secretary.** The Secretary of Agriculture of the United States.

Sec. 3 **Office of Public Roads.** The Office of Public Roads and Rural Engineering of the United States Department of Agriculture.

Sec. 4. **Ten per cent fund.** Items for engineering, inspection, and unforeseen contingencies, not exceeding ten per cent of the total estimated cost of the work.

Sec. 5. **Authorized representatives of the Secretary.** The Director of the Office of Public Roads and such other officials and employees thereof as he may designate from time to time.

### Regulation 2. Application of Regulations.

Section 1. These regulations apply to all provisions, except section eight, of the Act and shall not be applied to section eight unless hereafter authorized or required by order of the Secretary.

Sec. 2. These regulations shall apply as fully where the State cannot constitutionally engage in any work of internal improvements as in any other case, when any number of counties in such State shall appropriate or provide the proportion or share to be raised in order to entitle such State to its part of the appropriation apportioned under the Act.

### Regulation 3. Information for the Secretary.

Section 1. Before an agreement is made upon any road or roads to be constructed in a State, or the character and method of construction, upon request of the Secretary there shall be furnished to him, by or on behalf of the State, general information as to its laws affecting roads and the authority of the State and local officials in reference to the construction and maintenance of roads; as to schemes for future construction; and as to provisions made, or to be made, for constructing and maintaining roads upon which it is contemplated that the expenditure of money appropriated by or under the Act will be proposed. The information furnished shall be sufficient to enable the Secretary to determine whether it is likely that the money apportioned to the

State will be expended, and the roads constructed will be properly maintained, in accordance with the terms of the Act.

Sec. 2. Information requested by the Secretary or his authorized representatives, relating to the maintenance of roads constructed under the provisions of the Act, shall be furnished, from time to time, by the State Highway Departments, on forms supplied by the Office of Public Roads.

Sec. 3. Data furnished by or on behalf of a State shall be supplemented by such reports of the Office of Public Roads as the Secretary may from time to time require before he decides whether the State has complied with the terms of the Act or has presented a project statement which should be approved.

#### Regulation 4. Project Statements.

Section 1. A project statement shall contain all information necessary to enable the Secretary to ascertain (a) whether the project conforms to the requirements of the Act; (b) whether adequate funds, or their equivalent, are or will be available by or on behalf of the State for construction; (c) what purpose the project will serve and how it correlates with the other highway work of the State; (d) the administrative control of, and responsibility for, the project; (e) the practicability and economy of the project from an engineering and construction standpoint; (f) the adequacy of the plans and provisions for proper maintenance of roads; and (g) the approximate amount of Federal aid desired. With each statement there shall be submitted for the approval of the Secretary copies of the form of contract, together with all documents referred to therein or made part thereof, and of the contractor's bond which it is proposed to use on the project. No alteration of such forms shall be made until it is approved by the Secretary.

Sec. 2. Suitable forms for project statements will be supplied by the Office of Public Roads.



*Constructing Hard Surface Highway, Silver Bow County.*



Sec. 3. Project statements for any fiscal year may be submitted at any time after the apportionment for that year shall have been made.

Sec. 4. Projects will be deemed preferred, and recommended for approval, by the State Highway Department in the order in which the project statements are submitted, unless it be otherwise specified in writing; but the Secretary may, in his discretion, consider the projects in a different order.

Sec. 5. Each project statement shall be accompanied by a sketch map, showing the location of the proposed project and all main contiguous transportation features.

Sec. 6. Suitable samples of materials suggested for use in the construction of a project shall be submitted to the Office of Public Roads, whenever requested by it, for examination prior to the Secretary's decision on a project statement.

Sec. 7. Where any part of the cost of a project is to be furnished by a county or other local subdivision or subdivisions of a State, the project statement shall be accompanied by a certified copy of each resolution or order, if any, of the appropriate local officials respecting the funds which are to be made available, or respecting the funds which are or will be made available, or respecting the supervision of the construction of the road and of the expenditure of the money provided or to be provided for paying such cost.

#### **Regulation 5. Surveys, Plans, Specifications, and Estimates.**

Section 1. Surveys and plans shall show, in convenient form and sufficient detail, according to accepted engineering practice, necessary data, in connection with the specifications and estimates, to enable the Secretary to ascertain and pass upon location, grades, drainage, bridges, other structures, special and unusual features, the work to be performed, and the probable cost thereof.

Sec. 2. Specifications shall set forth the proposed method of construction, type of construction, materials to be used, and other essentials, in such detail as to afford complete knowledge of all steps to be taken in the construction of the project.

Sec. 3. The estimate for each project shall show the estimated quantity and cost of each item of construction in detail and, separately, the ten per cent fund, and shall not include any expense of advertising.

Sec. 4. Rights of way necessary for any project shall be provided, and any incidental damages adjoining property due to construction work paid, by or on behalf of the State, and the expense thereof shall not be included in the estimate or paid in any part, directly or indirectly by the Federal Government.

Sec. 5. Grade crossings shall be avoided where practicable. The estimated cost of eliminating a grade crossing shall not include any amount the State, county, or other civil subdivision has received, is to receive, or is entitled to receive, directly or indirectly, as reimbursement or payment from the owner of a public utility, for or on account of such elimination.

Sec. 6. No part of the expense of making surveys, plans, specifications or estimates, by or on behalf of the State prior to the beginning of construction work, shall be included in the estimate or paid by the Federal Government.

Sec. 7. When plans, specifications and estimates have been approved by the Secretary, no alteration thereof shall be made without his approval.

Sec. 8. For all projects for which statements are submitted after December 31, 1916, standards governing the form and arrangement of plans, specifications and estimates will be hereafter prescribed and promulgated by the Secretary.

#### **Regulation 6. Project Agreements.**

Section 1. A project agreement between the State Highway Department and the Secretary shall be executed, in triplicate, on a form furnished by him, previous to commencement of the construction of the project.

#### **Regulation 7. Contracts.**

Section 1. No part of the Federal money set aside on account of any project shall be paid until it has been shown to the satisfaction of the Secretary that adequate means, either by advertising or by other devices appropriate for the purpose, were employed, prior to the beginning of construction, to insure the economical and practical expenditure of such money.

Sec. 2. Immediately on publication of advertisements, copies thereof shall be furnished to the Office of Public Roads.

Sec. 3. Bids shall be in such form that the unit prices at which the various services are to be performed, and the various materials furnished, will be clearly shown.

Sec. 4. Copy of the tabulated bid prices, showing the unit prices and the totals of each bid for every project, shall be furnished promptly to the Office of Public Roads.

Sec. 5. In advance of the acceptance of any bid, sufficient notice of the time and place the contract is to be awarded shall be given to the Office of Public Roads to enable it, if it so desire, to have a representative present. When a bid has been accepted prompt notice thereof shall be given to the Office of Public Roads.

Sec. 6. If the contract be awarded to any other than the lowest responsible bidder, the Federal Government shall not pay more than its pro rata share of the lowest responsible bid, unless it be satisfactorily shown that it was advantageous to the work to accept the higher bid.

Sec. 7. A copy of each contract as executed shall be immediately certified by the State Highway Department and furnished to the Office of Public Roads.

Sec. 8. The specifications and plans shall be made a part of the contract.

Sec. 9. No alteration in such contract shall be made without the approval of the Secretary.



### Regulation 8. Construction Work and Labor.

Section 1. Suitable samples of materials to be used in construction work shall be submitted, by or on behalf of the State Highway Department, to the Office of Public Roads, whenever requested.

Sec. 2. Unless otherwise stipulated in writing by the Secretary or his authorized representative, materials for the construction of any project, shall, prior to use, be tested for conformity with specifications, according to methods prescribed, or approved, by the Office of Public Roads.

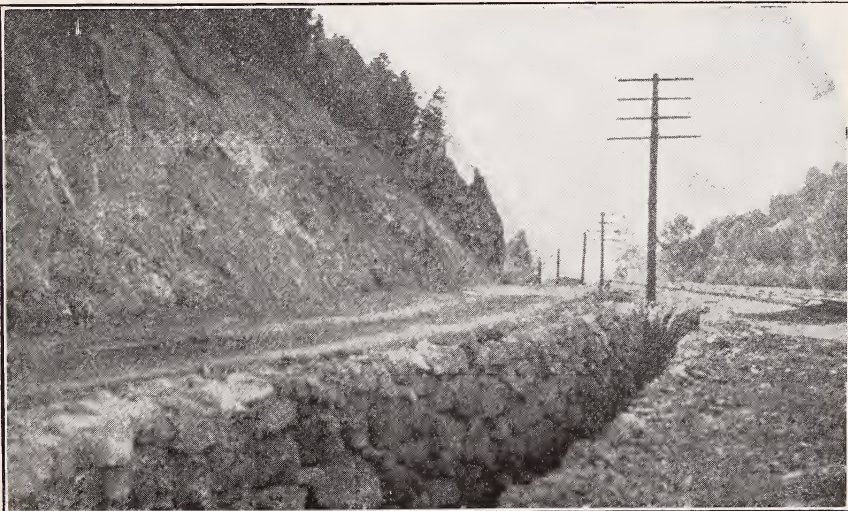
Sec. 3. Unless otherwise specifically stipulated in the project agreement, bridges, viaducts and under-passes shall have clear width of roadway of not less than 16 feet, and clear head room of not less than 14 feet for a width of 8 feet at the center.

Sec. 4. No part of the money apportioned under the Act shall be used, directly or indirectly, to pay, or to reimburse a State, county or local subdivision for the payment of, any premium or royalty on any patented or proprietary material, specification, process, or type of construction, unless purchased or obtained on open actual competitive bidding at the same or a less cost than unpatented articles or methods equally suitable for the same purpose.

Sec. 5. The supervision of each project by the State Highway Department shall include adequate inspection throughout the course of construction.

Sec. 6. Written notice of commencement and completion of construction work on any project shall be given promptly by the State Highway Department to the Office of Public Roads.

Sec. 7. Reports of the progress of construction, showing force employed and work done, shall be furnished, from time to time, whenever requested by the Secretary or his authorized representative.



*Heavy Rock Work—Convict Built.*

Sec. 8. Labor, teams, material and equipment furnished, in lieu of money, by or on behalf of the State Highway Department on construction work shall be used only on such terms and conditions as are set forth in the project agreement.

#### **Regulation 9. Records and Cost Keeping.**

Section 1. A separate account for each project shall be so kept, by or under the direction of the State Highway Department, as to enable the Secretary, or his authorized representative, to ascertain at any time the expenditures on and the liabilities against the project and, separately, the condition of the ten per cent fund.

Sec. 2. Such other records of contract and force account work, and of inspections and tests by or on behalf of the State, shall be kept, by or under the direction of the State Highway Department, as will enable the Secretary, or his authorized representative, at any time to determine the condition of the construction and maintenance of, and the cost to the State and the Federal Government of the construction work and labor done on, any project.

Sec. 3. The accounts and records, together with all supporting documents, shall be open, at all times, to the inspection of the Secretary, or his authorized representative and copies thereof shall be furnished when requested.

Sec. 4. Certified copies of payrolls on force account work and of all vouchers for other expenditures shall be furnished, whenever requested by the Secretary or his authorized representative.

Sec. 5. Whenever requested by the Secretary or his authorized representative, unit costs on any project shall be kept, on forms furnished by the Office of Public Roads.

#### **Regulation 10. Payments.**

Section 1. Vouchers, in the form provided by the Secretary and certified as therein prescribed, showing amounts expended on any project and amount claimed to be due from the Federal Government on account thereof, shall be submitted by the State Highway Department to the Office of Public Roads, either after completion of construction of the project or, if the Secretary has determined to make payments as the construction progresses, at intervals of not less than one month.

#### **Regulation 11. Office of Public Roads.**

Section 1. Papers and documents required by the Act or these regulations to be submitted to the Secretary may be delivered to the Office of Public Roads and from the date of such delivery shall be deemed submitted.



## Rules and Regulations of the Secretary of Agriculture Under Section Eight of the Federal Aid Road Act.

### Regulation 1. Definitions.

For the purposes of these regulations the following terms shall be construed respectively to mean:

**Section 1. Act.** Section 8 of an Act of Congress entitled, "An Act To provide that the United States shall aid the States in the construction of rural post roads, and for other purposes," approved July 11, 1916 (Public—No. 156—64th Congress).

**Sec. 2. Secretary.** The Secretary of Agriculture of the United States.

**Sec. 3. Office of Public Roads.** The Office of Public Roads and Rural Engineering of the United States Department of Agriculture.

**Sec. 4. Local authority.** The State, Territory, or county jointly or severally making application for the survey and construction of a road or entering into a cooperative agreement with the Secretary.

**Sec. 5. State.** Any State or Territory.

**Sec. 6. Road.** A road, trail, or bridge.

**Sec. 7. National Forest Road.** A road constructed or to be constructed in cooperation with the local authorities under the direct supervision of the Secretary of Agriculture, and paid for in whole or in part out of the moneys made available by the Act.

**Sec. 8. Cooperative Road.** A road constructed or to be constructed under State, Territory, or county supervision and under cooperative agreement as provided in the Act, but paid for out of funds other than those appropriated by the Act.

**Sec. 9. Construction.** Reconstruction and improvement of roads as well as original construction.

**Sec. 10. Maintenance or Properly Maintain.** The making of needed repairs and the preservation of a reasonably smooth surface, considering the type of road, but not extraordinary repairs or reconstruction.

**Sec. 11. State Highway Department.** Any department of another name, or commission, or official or officials, of a State empowered, under its laws, to exercise the functions ordinarily exercised by a State Highway department.

### Regulation 2. Apportionment.

**Section 1.** Ten per centum of each annual appropriation shall be withheld as a special fund, from which, as directed by the Secretary, the apportionment to any State, hereafter provided may be increased, and from which there shall be paid such amounts as the Secretary may find necessary for the general administration of the provisions of the Act. The remaining ninety per centum of each annual appropriation shall be apportioned to the States as follows: One-half on the basis that the aggregate area of the lands of the United States in the

National Forests in each State bears to the total land area of such State and one-half in the proportion that the estimated value of timber and forage resources of the National Forests in such State bears to the total value of timber and forage resources of the National Forests of all the States: **Provided, however,** That in such apportionment the States of Florida, Michigan, Minnesota, Nebraska, North Dakota, and Oklahoma shall be considered as a unit of apportionment, and the States within which lands have been acquired by the United States under the provisions of the Act of March 1, 1911 (36 Stat. 961), entitled, "An Act to enable any State to cooperate with any other State of States or with the United States for the protection of watersheds of navigable streams, and to appoint a commission for the acquisition of lands for the purpose of conserving the navigability of navigable rivers," known as the Weeks Law, shall also be considered as a unit of apportionment.

Sec. 2. The apportionment for the fiscal year ending June 30, 1917, shall be made as of the date of the approval of these regulations, and on or before the first day of January next preceding the commencement of each fiscal year the Secretary will make like apportionment for such fiscal year.

Sec. 3. Any amounts apportioned to the States as herein provided remaining unexpended for a period of three years after such apportionment, may be reapportioned by the Secretary to the several States in the manner provided for original apportionment.

### **Regulation 3. Applications.**

Section 1. Application for the survey, construction, and maintenance of roads under the Act shall be made by the proper local authority to the Secretary, upon forms furnished by the Forest Service, and filed in the district office of the Forest Service for the district within which the proposed road is located. Any application by a county in a State having a State Highway Department shall, before filing, be referred to such department for its recommendation, which shall be filed with the application.

Sec. 2. Applications for the fiscal year ending June 30, 1917, shall be filed on or before October 1, 1916, and for each succeeding fiscal year, on or before the first day of January next preceding such fiscal year.

Sec. 3. Each application shall contain: (a) Satisfactory evidence of authority to make application on behalf of the State, Territory or county, and to enter into a cooperative agreement with the Secretary for the survey, construction and maintenance of the proposed road; (b) a statement of the public needs to be served by the proposed road and the manner in and extent to which such road is necessary for the use and development of the resources upon which communities within or adjacent to the National Forests are dependent; (c) a statement showing (1) the general location of the proposed road, (2) its termini, length, grades, and estimated cost, and (3) the name, population and location with respect to the proposed road of each community that would be benefited thereby; and (d) proposals for cooperation, giving in detail the amount



and extent of the cooperation offered, whether in money, materials, labor, or the construction of a cooperative road, and whether cooperative moneys will be held and disbursed by the local authority or will be deposited in the United States Treasury in accordance with the provisions of the Act of Congress approved June 30, 1914 (38th Stat. 415, 430), entitled, "An Act making appropriations for the Department of Agriculture for the fiscal year ending June thirtieth, nineteen hundred and fifteen," creating a special fund of contributions for cooperative forest work, available until expended, for the payment of the expenses of such work and for refunds to the contributors of amounts paid by them in excess of their share of such work.

Sec. 4. Applications which are not approved for the fiscal year for which made will be retained and unless modified or withdrawn by the applicant, will be considered for succeeding fiscal years.

#### **Regulation 4. Selection of Projects.**

Section 1. The Forest Service shall prepare: (a) A project plan for each State, providing, as far as practicable, for a comprehensive road system in the National Forests, showing, in the order of their importance, the roads within or partly within the National Forests which it believes should be constructed; (b) maps showing the road system for each National Forest, and delimiting the projects listed, as provided in section three hereof, with a mark or marks of identification for each; and (c) a statement for each county in which there is a National Forest, showing the maximum amount which may be expended therein under the Act.. Such project plans, maps, and statements shall be submitted to the Secretary for approval, and after such approval shall be transmitted to the Office of Public Roads for its information.

Sec. 2. Unless satisfactory data are already available, reconnaissance surveys and preliminary cost estimates shall be made, by or under the direction of the Office of Public Roads, of all road projects for which proper application has been made.

Sec. 3. A list of the projects applied for, arranged as to each State in the order in which construction is recommended, shall be forwarded each year for presentation to the Secretary. The project list as approved by the Secretary shall determine the order of construction for each year.

#### **Regulation 5. Cooperative Agreement.**

Section 1. Upon the approval of any project list, a cooperative agreement for execution by the Secretary and the local authority shall be prepared by the Solicitor from data furnished by the Forest Service and the Office of Public Roads for each of these projects in the order listed, for which funds are or will be available, and shall provide for: (a) Surveys, plans, construction and maintenance of the project to be done in accordance with these rules and regulations; (b) amount, value and character of cooperation; (c) furnishing of labor and materials, the deposit of cooperative funds in the Treasury, or the disbursement of such funds by the local authority; (d) supervision and inspection during

construction and approval upon completion; (e) final accounting to each party to the agreement of all labor or materials furnished and all moneys expended under the agreement; and (f) such other terms as in the opinion of the Secretary should be included.

Sec. 2. The basis of cooperation shall be the reconnoissance survey estimate of the cost of final survey and construction. Cooperation shall be expressed as far as feasible in percentages. If the location survey estimates exceed the reconnoissance estimates by twenty-five per centum or more, the Secretary shall so notify the local authority, and at any time within thirty day either party to the agreement may apply for a modification thereof. If modifications can be agreed upon, a supplementary agreement, if necessary, shall be drawn; otherwise, either party may withdraw from the agreement upon thirty days' notice. In the case of such excess, construction shall not be started nor advertisements made for bids until final agreement is reached.

Sec. 3. Each local authority will be required to cooperate as herein defined in an amount at least equal to fifty per centum of the estimated cost of the final survey and construction and the entire cost of maintenance of National Forest roads, unless a satisfactory showing is made to the Secretary that such an amount of cooperation is inequitable. Cooperation by local authorities may be in the form of money, labor, materials, or the construction of cooperative roads, and the amount and value thereof shall be fixed by the Secretary. Cooperation in the form of road construction will be accepted only when such cooperative road connects with and is an extension of a National Forest road, and to the extent only that such road is necessary to furnish a connection between a National Forest road and the general State, Territory, or county road system. Such cooperative road may be either within or without National Forest boundaries.



*Constructing Hard Surface Road, Silver Bow County.*



**Regulation 6. Surveys, Construction, and Maintenance.**

Section 1. Upon the execution of a cooperative agreement the Office of Public Roads shall proceed with the survey and construction of the road in accordance with such cooperative agreement.

Sec. 2. National Forest roads shall be constructed under the supervision of the Office of Public Roads, in accordance with plans prepared by it and approved by the Forest Service. The maintenance of such roads shall be under the supervision of the Office of Public Roads, unless otherwise provided in the agreement.

Sec. 3. Cooperative roads shall be constructed in accordance with plans made as provided in the cooperative agreement and approved by the Office of Public Roads and the Forest Service. Such roads shall be subject to approval by the Secretary on completion, and to inspection by the Office of Public Roads during construction and maintenance. Cooperative roads shall be maintained by local authorities.

Sec. 4. If a cooperative road is not constructed as provided in the preceding section, or any road constructed under a cooperative agreement is not properly maintained in accordance with its terms, or there is a failure to comply with any other of the terms, the Secretary will give notice of such fact to the proper local authority. If within four months from the receipt of such notice the terms of such agreement are not complied with, the Secretary will thereafter refuse to enter into any other cooperative agreement with such local authority until compliance has been made with the original agreement.

**Regulation 7. Accounting.**

Section 1. All Federal funds expended for road construction under the Act, and all cooperative funds which may be deposited in the United States Treasury in accordance with the Act of Congress approved June 30, 1914 (38 Stat. 415, 430), mentioned in section 3 of regulation 3, shall be disbursed as directed by the Secretary of Agriculture.

Sec. 2. Cooperative funds used for the survey and construction of National Forest roads, but not deposited in the Treasury, shall be disbursed by the local authority only upon vouchers approved by the Office of Public Roads.

Sec. 3. A separate account shall be kept, as directed by the Secretary, of all moneys disbursed for National Forest roads, showing the States and counties within which and the projects upon which such moneys have been expended, and the Secretary will furnish to the local authorities a detailed statement of such expenditures as soon as practicable after the completion of every project.

Sec. 4. Unless otherwise directed by the Secretary, records of the costs of survey and construction of all road projects, whether cooperative or National Forest roads, shall be kept upon forms to be supplied by the Office of Public Roads. If the Secretary shall so direct, progress statements or reports shall be submitted from time to time to the Office of Public Roads on forms supplied by that Office, and within ninety days after the completion of a project the local authority shall submit to the



Secretary a final report of the project on a form supplied by the Office of Public Roads.

Sec. 5. Immediately upon the execution of a cooperative agreement the Secretary will notify the Secretary of the Treasury of the amount to be expended by the United States within or adjacent to any National Forest thereunder, and upon the completion of each project and the closing of the project accounts relating thereto, the Secretary will submit to the Secretary of the Treasury a statement of the total expenditures of Federal funds made on account thereof, and the distribution of such expenditures to each National Forest concerned.

(PUBLIC—NO. 156—H. R. 7617—64th CONGRESS.)

An Act To provide that the United States shall aid the States in the construction of rural post roads, and for other purposes.

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Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of Agriculture is authorized to cooperate with the States, through their respective State Highway departments, in the construction of rural post roads; but no money apportioned under this Act to any State shall be expended therein until its legislature shall have assented to the provisions of this Act, except that, until the final adjournment of the first regular session of the legislature held after the passage of this Act, the assent of the governor of the State shall be sufficient. The Secretary of Agriculture and the State highway department of each State shall agree upon the roads to be constructed therein and the character and method of construction: **Provided**, That all roads constructed under the provisions of this Act shall be free from tolls of all kinds.

Sec. 2 That for the purpose of this Act the term, "rural post road" shall be construed to mean any public road over which the United States mails now are or may hereafter be transported, excluding every street and road in a place having a population, as shown by the latest available Federal census, of two thousand five hundred or more, except that portion of such street or road along which the houses average more than two hundred feet apart; the term "State highway department" shall be construed to include any department of another name, or commission, or official or officials, of a State empowered, under its laws, to exercise the functions ordinarily exercised by a State highway department; the term "construction" shall be construed to include reconstruction and improvement of roads; "properly maintained" as used herein shall be construed to mean the making of needed repairs and the preservation of a reasonable smooth surface considering the type of the road; but shall not be held to include extraordinary repairs, nor reconstruction; necessary bridges and culverts shall be deemed parts of the respective roads covered by the provisions of this Act.

Sec. 3. That for the purposes of carrying out the provisions of this Act there is hereby appropriated, out of any money in the Treasury not otherwise appropriated, for the fiscal year ending June thirtieth, nine-

teen hundred and seventeen, the sum of five million dollars; for the fiscal year ending June thirtieth, nineteen hundred and eighteen, the sum of \$10,000,000; for the fiscal year ending June thirtieth, nineteen hundred and nineteen, the sum of \$15,000,000; for the fiscal year ending June thirtieth, nineteen hundred and twenty, the sum of \$20,000,000; and for the fiscal year ending June thirtieth, nineteen hundred and twenty-one, the sum of \$25,000,000. So much of the appropriation apportioned to any State for any fiscal year as remains unexpended at the close thereof shall be available for expenditure in that State until the close of the succeeding fiscal year, except that amounts apportioned for any fiscal year to any State which has not a State highway department shall be available for expenditure in that State until the close of the third fiscal year succeeding the close of the fiscal year for which such apportionment was made. Any amount apportioned under the provisions of this Act unexpended at the end of the period during which it is available for expenditure under the terms of this section shall be reapportioned, within sixty days thereafter, to all the States in the same manner and on the same basis, and certified to the Secretary of the Treasury and to the State highway departments and to the governors of the States having no State highway departments in the same way as if it were being apportioned under this Act for the first time: **Provided**, That in States where the constitution prohibits the State from engaging in any work of internal improvements, then the amount of the apportionment under this Act apportioned to any such State shall be turned over to the highway department of the State or to the governor of said State to be expended under the provisions of this Act and under the rules and regulations of the Department of Agriculture, when any number of counties in any such State shall appropriate or provide the proportion or share needed to be raised in order to entitle such State to its part of the appropriation apportioned under this Act.

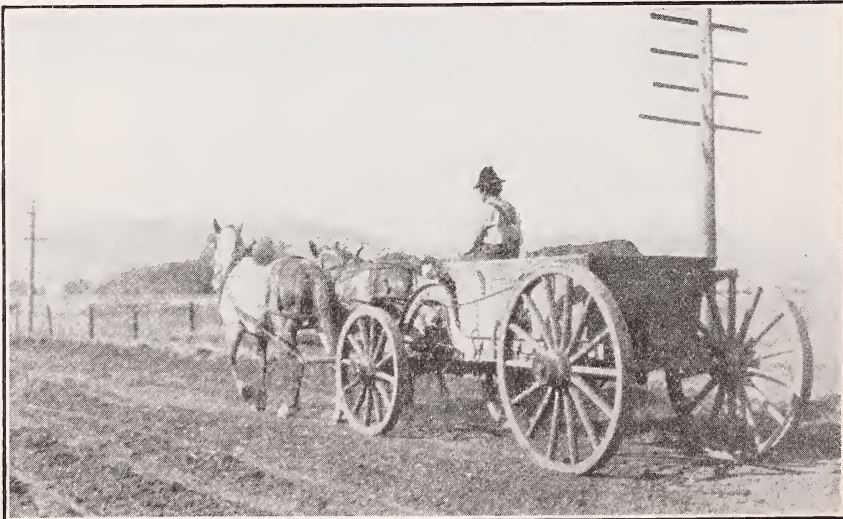
Sec. 4. That so much, not to exceed three per centum, of the appropriation for any fiscal year made by or under this Act as the Secretary of Agriculture may estimate to be necessary for administering the provisions of this Act shall be deducted for that purpose, available until expended. Within sixty days after the close of each fiscal year the Secretary of Agriculture shall determine what part, if any, of the sums theretofore deducted for administering the provisions of this Act will not be needed for that purpose and apportion such part, if any, for the fiscal year then current in the same manner and on the same basis, and to certify it to the Secretary of the Treasury and to the State highway departments, and to the governors of States having no State highway departments, in the same way as other amounts authorized by this Act to be apportioned among all the States for such current fiscal year. The Secretary of Agriculture, after making the deduction authorized by this section, shall apportion the remainder of the appropriation for each fiscal year among the several States in the following manner: One-third in the ratio which the area of each State bears to the total area of all the States; one-third in the ratio which the population of each State bears to the total population of all the States, as shown by the latest available



Federal census; one-third in the ratio which the mileage of rural delivery routes and star routes in each State bears to the total mileage of rural delivery routes and star routes in all the States, at the close of the next preceding fiscal year, as shown by the certificate of the Postmaster General, which he is directed to make and furnish annually to the Secretary of Agriculture.

Sec. 5. That within sixty days after the approval of this Act the Secretary of Agriculture shall certify to the Secretary of the Treasury and to each State highway department and to the governor of each State having no State highway department the sum which he has estimated to be deducted for administering the provisions of this Act and the sum which he has apportioned to each State for the fiscal year ending June thirtieth, nineteen hundred and seventeen, and on or before January twentieth next preceding the commencement of each succeeding fiscal year shall make like certificates for such fiscal year.

Sec. 6. That any State desiring to avail itself of the benefits of this Act shall, by its State highway department, submit to the Secretary of Agriculture project statements setting forth proposed construction of any rural post road or roads therein. If the Secretary of Agriculture approve a project, the State highway department shall furnish to him such surveys, plans, specifications and estimates therefor as he may require: **Provided, however,** That the Secretary of Agriculture shall approve only such projects as may be substantial in character and the expenditure of funds hereby authorized shall be applied only to such improvements. Items included for engineering, inspection, and unforeseen contingencies shall not exceed ten per centum of the total estimated cost of the work. If the Secretary of Agriculture approve the plans, specifications, and estimates, he shall notify the State highway department and immediately certify the fact to the Secretary of the Treasury. The Secretary of the Treasury shall thereupon set aside the share of



*Commission Equipment Graveling Roads.*



the United States payable under this Act on account of such project, which shall not exceed fifty per centum of the total estimated cost thereof. No payment of any money apportioned under this Act shall be made on any project until such statement of the project, and the plans, specifications, and estimates therefor, shall have been submitted to and approved by the Secretary of Agriculture.

When the Secretary of Agriculture shall find that any project so approved by him has been constructed in compliance with said plans and specifications he shall cause to be paid to the proper authority of said State the amount set aside for said project: **Provided**, That the Secretary of Agriculture may, in his discretion, from time to time make payments on said construction as the same progresses, but these payments including previous payments, if any, shall not be more than the United States' pro rata part of the value of the labor and materials which have been actually put into said construction in conformity to said plans and specifications; nor shall any such payment be in excess of \$10,000 per mile, exclusive of the cost of bridges of more than twenty feet clear span. The construction work and labor in each State shall be done in accordance with its laws, and under the direct supervision of the State highway department, subject to the inspection and approval of the Secretary of Agriculture and in accordance with the rules and regulations made pursuant to this Act.

The Secretary of Agriculture and the State highway department of each State may jointly determine at what times, and in what amounts, payments, as work progresses, shall be made under this Act. Such payments shall be made by the Secretary of the Treasury, on warrants drawn by the Secretary of Agriculture, to such official, or officials, or depository, as may be designated by the State highway department and authorized under the laws of the State to receive public funds of the State or county.



*Rock Cut Convict Work, Powell County.*

Sec. 7. To maintain the roads constructed under the provisions of this Act shall be the duty of the States, or their civil subdivisions, according to the laws of the several States. If at any time the Secretary of Agriculture shall find that any road in any State constructed under the provisions of this Act is not being properly maintained he shall give notice of such fact to the highway department of such State and if within four months from the receipt of said notice said road has not been put in proper condition of maintenance then the Secretary of Agriculture shall thereafter refuse to approve any project for road construction in said State, or the civil subdivision thereof, as the fact may be, whose duty it is to maintain said road, until it has been put in a condition of proper maintenance.

Sec. 8. That there is hereby appropriated and made available until expended, out of any moneys in the National Treasury not otherwise appropriated, the sum of \$1,000,000 for the fiscal year ending June thirtieth, nineteen hundred and seventeen, and each fiscal year thereafter, up to and including the fiscal year ending June thirtieth, nineteen hundred and twenty-six, in all \$10,000,000, to be available until expended under the supervision of the Secretary of Agriculture, upon request from the proper officers of the State, Territory, or county for the survey, construction, and maintenance of roads and trails within or only partly within the national forests, when necessary for the use and development of resources upon which communities within and adjacent to the national forests are dependent: **Provided**, That the State, Territory, or county shall enter into a cooperative agreement with the Secretary of Agriculture for the survey, construction, and maintenance of such roads or trails upon a basis equitable to both the State, Territory, or county, and the United States: **And provided also**, That the aggregate expenditures in any State, Territory, or county shall not exceed ten per centum of the value, as determined by the Secretary of Agriculture, of the timber and forage resources which are or will



*Convict Grading Crew.*



be available for income upon the national forest lands within the respective county or counties wherein the roads or trails will be constructed; and the Secretary of Agriculture shall make annual report to Congress of the amounts expended hereunder.

That immediately upon the execution of any cooperative agreement hereunder the Secretary of Agriculture shall notify the Secretary of the Treasury of the amount to be expended by the United States within or adjacent to any national forest thereunder, and beginning with the next fiscal year and each fiscal year thereafter the Secretary of the Treasury shall apply from any and all revenues from such forest ten per centum thereof to reimburse the United States for expenditures made under such agreement until the whole amount advanced under such agreement shall have been returned from the receipts from such national forest.

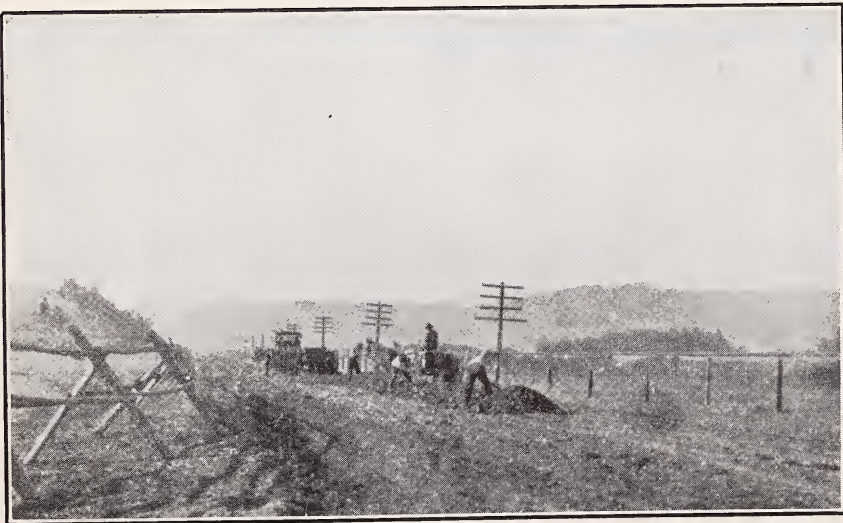
Sec. 9. That out of the appropriations made by or under this Act, the Secretary of Agriculture is authorized to employ such assistants, clerks, and other persons in the city of Washington and elsewhere, to be taken from the eligible lists of the Civil Service Commission, to rent buildings outside of the city of Washington, to purchase such supplies, material, equipment, office fixtures, and apparatus, and to incur such travel and other expense as he may deem necessary for carrying out the purposes of this Act.

Sec. 10. That the Secretary of Agriculture is authorized to make rules and regulations for carrying out the provisions of this Act.

Sec. 11. That this Act shall be in force from the date of its passage.

Approved, July 11, 1916.

In order to meet the requirements of the federal aid act the State Highway Commission must have available a sum equal to each year's



*Convict Work Graveling, Powell County.*



allotment by the Government together with sufficient additional funds to take care of the administration of the proposed five organizations.

After the first year's work is completed and an organization perfected to handle the work, the executive engineering expense will be practically the same each year, as there will be very little additional force necessary to handle the large contracts than the first small ones. I estimate the cost of administration to be about \$40,000 per year, which must be provided by the state, in addition to the sum necessary to meet the federal allotments. This expense, I believe, should be divided between the state department and the county securing aid.

If the automobile license tax is raised so as to net \$10.00 per car, approximately \$300,000 per annum can be secured in this manner. Setting aside a sufficient sum for administrative purposes, \$260,000 is left available to meet the federal appropriations.

An additional sum might be raised by forming special improvement districts in the thickly populated sections through which the roads may pass assessing a small part of the cost to abutting property, similar to the improvement district procedure in cities.

Automobile trucks and traction engines should be assessed in proportion to the load carried as these two vehicles are the most destructive elements encountered on the roads and they should be required to pay a portion of their share toward the construction of these roads.

A license of \$50.00 per annum on each truck using the roads would bring in an annual revenue of \$50,000.00, and a \$20.00 license tax on each traction engine would bring in annually about \$15,000.00. If the number of automobiles used increases in the same relative proportion as it has in the past four years, there will be sufficient funds available from these sources to provide for the 1916-17 and 1917-18 program.

To further meet the federal allotments during the last three years of the construction period, I would propose the enactment of a constitutional amendment providing for a tax levy of not to exceed one mill



*Proper Maintenance.*

on the dollar to be levied annually on all the taxable property in the state, to be used for the improvement of roads under the supervision of the state.

### Hard Surfaced Roads.

Heretofore the best road that could be considered was a gravel or crushed rock, built from the material obtained on the road site. However, the ever-increasing traffic due to automobile trucks and tonnage brings the question of hard surfacing up for serious consideration in many of our counties.

Yellowstone County issued bonds in the sum of \$200,000.00 for the purpose of building 50 miles of gravel macadam roads, and the same are now under construction. However, due to the destructive action of fast-moving motor traffic, construction of gravel or water bound macadam roads can hardly be considered prudent. Silver Bow County found that it was utterly impossible to maintain its earth roads under the congested automobile traffic brought to bear upon them. During the season of 1916 the county commissioners of Silver Bow County entered into a contract with Storey & Hager for the construction of two miles of bitumen bound macadam road. This road was constructed under what was known as the penetration method, and was placed upon what is known as the Yellowstone Trail, beginning at the city limits on Harrison Avenue and extending east to the five-mile house on this road. The road was surfaced to a width of thirty feet, with a four-inch wearing surface of lime rock macadam bound with 95% asphaltum placed on the surface with a pressure sprayer and under pressure of about 45 pounds per square inch.

„

At this time it is impossible to tell the results of this experiment, but this piece of construction is being closely watched in order that the



*Gravelling Equipment.*



results obtained may be used as a basis upon which to place future recommendations.

The cost of the surfacing after the foundation was prepared, that is, according to the placing of drainage structures which in this case were already in place, was \$5,600 per mile, or upon a basis of 48c per surface yard. This price, if the same can be duplicated, would admit of the hard surfacing of roads by this method of construction at about \$2,600 per mile, and should this experiment prove successful there are many localities that could afford to build a considerable mileage of this class of road.

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### PRISON LABOR.

During the past two years one crew of convicts has been employed under the supervision of the Commission. During 1915-16 fifty miles of roads were constructed in Powell County, mostly heavy rock work, between the continental divide west of Helena and Gold Creek. A branch road was also constructed from Kohrs northward, intersecting the main east and west road six miles east of Garrison, about six miles in length.

It is found that prison labor is only profitable on work located within a reasonable distance of the prison and it is recommended that the work be confined to such places as can be conveniently reached from the base of supplies at Deer Lodge. It was found that when prison labor is used at points far remote from the prison that the extra cost of transportation of men to and from the prison at Deer Lodge to the road camps places a limit upon the advisability of working state prisoners on the public roads at points far distant from Deer Lodge, a radius of from one hundred to one hundred and twenty-five miles being near the limit to which it is profitable to transport the men.

The prison crew is at present employed on a very difficult and heavy piece of rock work on the main road between Divide and Wisdom in Beaverhead County.

The following equipment, provided by the State Highway Commission, is being used by the prison forces:

Seven 1½ yard dump wagons.

Three 3½ yard freight wagons.

One spring wagon for light trips and errands.

Six No. 2 wheel scrapers.

Six 5-foot fresnoes.

Fourteen teams with harness.

One 6-foot batch cement mixer.

One four-ton auto truck.

A supply of plows, scrapers, and other small tools, such as shovels, picks, steel, harness, etc., is provided at all times by the Commission. A rental being collected for use of same sufficient to keep the equipment in repair.



In conclusion, would recommend that the legislature amend the present highway commission law in such manner as to enable the commission to meet the requirements of the Federal Aid Act. The general highway law respecting the construction of bridges should be so amended as to make the same more concise, and clearly define the duties of the Commission in the matter of the furnishing of plans and specifications for bridge work within the State.

In order to meet the requirements of the Federal aid road Act in the forest reservation counties I would recommend that the forest revenue funds now accruing to the forest reserve counties wherein one-third is placed to the credit of the school fund of such county and two-thirds to the general road fund, be amended in such way as to make these funds available for meeting the federal road appropriations under the provisions of Section 8 of the Federal Aid Road Act. Such an arrangement would better enable the State to meet the Federal appropriations in the counties outside of forest reserves. The general road law should be so amended as to more clearly define the duties of the county commissioners of each county, and provision should be made for the payment of a per diem and expenses of the Boards of County Commissioners, or any member thereof, while engaged by authority of such board in the administration of the road laws in their several counties .

The duties of the county surveyor have become such that his work is much of the same class as that of the city engineer in the various cities. I believe the law respecting this office should be amended in such manner as to require certain educational and experience qualifications; that the county surveyor's office be placed upon a salary rather than a per diem basis, and that he be given authority to appoint such deputies as are necessary to properly carry out the provisions of the law in the several counties.

Respectfully submitted,

GEO. R. METLEN, Secretary.

Approved by Commission, Dec. 1, 1915.

Table I.

## ROAD FUNDS

TOTALS OF MONEY RECEIVED AND PAID OUT DURING THE FISCAL YEAR ENDING DECEMBER 1, 1915, AND BALANCES ON HAND IN THE BRIDGE FUNDS OF THE COUNTIES OF MONTANA ACCORDING TO REPORTS OF COUNTY CLERKS.

COUNTY	Balance 1914....	Received 1915....	Total Credits 1915.....	Paid Out 1915.	Balance, Dec. 1, 1915....	Outstanding Warrants to Dec. 1, 1914....	Warrants Issued 1915.....	Total Outstanding Issued 1915	Warrants paid 1915.....	Outstanding Warrants Nov. 30, 1915...
Beaverhead.....	\$ 9,558.96	\$ 44,949.44	\$ 54,508.40	\$ 29,294.27	\$ 15,214.03	\$ 323.25	\$ 38,371.89	\$ 38,695.14	\$ 38,356.39	\$ 338.75
Big Horn.....	11,722.53	29,800.24	41,522.77	21,482.27	20,040.50	13,093.19	30,475.46	43,568.65	30,475.46	12,706.93
Blaine.....	1,434.16	9,751.92	11,186.08	61,934.01	3,747.03	30,761.65	27,359.70	68,121.35	60,529.82	7,591.53
Broadwater.....	16,630.48	48,955.46	65,585.94	46,568.68	13,197.11	6.00	39,600.92	39,606.93	39,074.68	532.25
Carbon.....	23,839.58	52,581.93	76,421.51	66,997.60	9,403.91	900.49	66,005.46	66,915.33	66,539.97	375.36
Cascade.....	61,630.86	121,419.00	183,049.86	127,071.15	55,978.71	64,992.75	53,578.13	54,178.82	43,553.28	10,625.54
Chouteau.....	20,521.30	218,355.11	238,876.41	217,562.91	21,313.50	82,632.56	121,592.89	136,582.64	135,206.06	51,379.58
Custer.....	32,353.19	107,911.92	140,265.11	87,324.91	52,940.20	82,632.56	57,258.62	139,891.21	139,313.83	577.88
Dawson.....	18,006.19*	58,933.12	76,939.31	67,325.92	9,613.39	215.64	83,173.82	83,419.46	83,135.03	284.43
Deer Lodge.....	17,316.07	58,933.12	76,249.19	47,112.06	29,137.13	49,610.55	38,999.08	88,609.63	63,379.79	25,029.84
Fallon.....	23,366.28	58,933.12	82,299.40	47,112.06	35,187.34	16,274.06	51,785.63	68,059.69	46,331.24	21,728.45
Fergus.....	26,843.20	29,373.62	56,216.82	29,143.82	27,073.00	234,250.86	112,199.54	346,530.40	282,924.46	63,605.94
Flathead.....	57,917.37	69,389.87	127,307.24	59,607.36	67,699.88	167,903.82	63,038.03	230,941.85	52,778.44	178,163.41
Gallatin.....	8,247.36	92,717.07	100,964.43	59,509.93	41,454.50	62,685.52	152,059.68	188,725.20	5,503.85	153,221.35
Granite.....	13,965.63	127,851.97	141,817.60	92,884.82	48,932.78	42,888.01	30,748.26	73,636.27	19,816.33	53,819.94
Hill.....	31,396.83	102,832.39	134,229.22	92,983.04	41,246.18	96,869.91	57,848.81	154,713.72	95,463.36	59,255.36
Jefferson.....	14,209.20	36,352.06	50,561.26	29,777.52	20,783.74	96,869.91	27,694.89	124,468.63	27,279.52	435.37
Lewis and Clark.....	1,752.22	61,352.67	63,104.89	63,030.22	1,074.67	27,765.49	96,581.59	124,347.08	90,184.37	34,162.71
Lincoln.....	26,753.24	39,269.97	66,023.21	41,477.27	24,545.94	11,940.43	79,683.04	91,623.47	53,704.38	37,919.09
Madison.....	29,209.43	39,172.93	68,382.37	32,001.90	36,380.47	98.15	39,386.31	39,477.36	39,277.27	200.09
Mcagher.....	47,326.24	32,743.80	80,070.04	20,787.60	59,282.44	10,077.28	70,710.21	29,405.05	29,001.90	403.15
Missoula.....	4,333.27	13,743.80	18,077.07	51,058.17	37,153.01	41,150.56	46,639.63	80,787.59	17,628.43	63,159.16
Musselshell.....	20,469.37	33,743.80	54,213.17	21,693.47	32,519.70	41,150.56	38,208.14	87,710.19	59,935.66	28,374.53
Mineral.....	9,820.35	33,486.92	43,307.27	45,588.82	6,728.45	154.00	40,785.16	38,764.47	31,398.30	7,366.17
Park.....	9,835.41	17,353.61	27,189.02	17,806.24	9,382.78	134.00	42,607.51	49,939.16	40,496.20	88.96
Phillips (New County).....	28,727.39	77,563.84	106,291.23	67,301.22	38,990.01	5.60	67,307.22	67,307.22	67,307.22	42,580.11
Powell.....	24,502.63	24,502.63	49,005.26	49,005.26	0.00	5.60	67,307.22	67,307.22	67,307.22	6.60
Prairie (New County).....	21,815.93	40,518.36	62,334.29	41,906.62	20,427.67	5.60	67,307.22	67,307.22	67,307.22	241.58
Ravalli.....	10,843.12	23,223.29	34,066.41	34,066.41	0.00	5.60	67,307.22	67,307.22	67,307.22	60,330.27
Richland.....	17,332.03	112,063.47	129,395.50	118,941.08	10,454.42	12,911.76	49,299.10	102,884.41	29,413.25	60,330.27
Rosebud.....	29,493.28	112,063.47	141,556.75	118,941.08	22,615.67	87,453.97	39,386.31	150,797.41	107,262.35	43,533.06
Sanders.....	71,444.16	16,952.43	88,396.59	89,951.17	5,445.42	69,838.80	52,644.13	122,473.93	90,943.08	36,529.85
Sheridan.....	23,118.57	57,431.21	80,549.78	46,121.26	34,428.52	30,314.75	71,987.62	102,362.88	80,095.02	22,207.36
Silver Bow.....	4,765.69	131,629.21	136,394.90	142,549.16	6,145.73	20,206.66	42,456.24	48,602.94	41,800.34	882.60
Stillwater.....	23,491.99	131,629.21	155,121.20	142,549.16	12,572.04	22,721.27	124,302.27	147,053.74	139,666.34	7,387.40
Sweet Grass.....	23,425.11	22,069.27	45,494.38	29,297.05	16,197.33	70.00	29,360.86	29,331.36	29,237.05	94.31
Teton.....	27,000.53	92,276.81	119,277.34	59,241.96	60,035.38	1,274.06	51,289.33	52,563.39	52,002.56	560.83
Toole.....	24,173.44	11,382.59	35,556.03	72,440.04	37,116.00	55,949.22	43,704.90	99,654.23	70,058.90	29,595.33
Valley.....	10,748.27	16,286.82	27,035.09	37,817.23	16,767.86	17,676.38	18,849.17	36,525.55	35,000.70	925.50
Wibaux.....	3,458.15	9,970.70	13,428.85	9,970.70	3,458.15	17,676.38	9,980.70	9,980.70	9,970.70	10.00
Yellowstone.....	38,429.14	91,063.60	129,492.74	86,649.00	42,843.74	1,716.60	83,279.55	86,996.15	86,996.15	351.22
	952,310.90	2,879,789.76	3,814,488.28	2,671,906.20	1,199,728.86	1,257,885.85	2,304,297.16	3,562,125.51	2,483,077.49	1,078,142.52

# ROAD FUNDS

Table II.

DETAILED TABULATION OF THE OPERATION OF THE GENERAL BRIDGE FUND EXPENDITURE FOR EACH COUNTY, FOR THE YEAR ENDING NOVEMBER 30th, 1915.

COUNTY	Inspection and Viewing.....	Supervisors.....	Engineering.....	Labor and Teams.....	Tools and Re- placements.....	Material.....	Contract Prices.....	Other Expenses.....	New Roads.....	Value Roads.....
Beaverhead.....	\$ 262.00	\$ 169.00	\$ 8,814.35	\$ 14,919.75	\$ 1,058.27	\$ 145.65	\$ .....	\$ .....	\$ 10,850.35	\$ 72,228.95
Big Horn.....	.....	.....	8.92	24,185.61	201.25	3,904.65	.....	85.88	1,547.15	92,142.15
Blaine.....	.....	.....	.....	25,497.71	1,670.35	10,948.76	1,091.50	1,553.61	6,801.92	97,382.74
Broadwater.....	.....	260.00	496.20	8,793.84	937.89	951.61	.....	497.16	21,291.48	51,536.23
Carbon.....	.....	.....	13,570.57	17,235.19	1,181.39	11,853.95	2,386.29	1,226.96	2,164.41	120,652.06
Cascade.....	278.00	2,332.30	.....	32,599.01	559.85	6,773.71	3,214.21	601.92	11,667.20	221,530.30
Chouteau.....	1,330.20	1,715.00	15,626.29	48,929.64	3,960.04	20,731.58	270.70	579.68	8,389.81	108,064.27
Custer.....	34.50	.....	6,461.48	42,796.28	512.44	12,707.60	.....	684.66	3,762.49	278,274.04
Dawson.....	5,504.13	30.50	2,801.95	47,178.97	833.76	12,739.96	258.32	512.80	4,094.71	49,421.70
Deer Lodge.....	.....	58.60	1,675.50	11,575.53	2,412.83	2,636.01	2,450.13	459.68	7,320.85	111,044.85
Fallon.....	909.95	124.55	5,208.65	32,832.71	324.25	5,209.19	159.91	.....	.....	135,000.00
Fergus.....	240.50	162.40	9,229.66	28,817.20	1,924.54	1,344.61	11,471.08	349.10	50,567.24	372,738.70
Flathead.....	173.10	311.93	13,274.66	30,263.15	870.68	13,214.04	33.85	537.77	2,702.40	523,283.82
Gallatin.....	30.00	57.75	4,815.29	90,595.55	9,022.77	4,386.85	2,274.11	12,261.44	465.00	414,941.75
Granite.....	386.10	16.00	6,095.00	14,503.80	188.02	543.73	.....	528.37	164,462.52	8,144.52
Hill.....	520.50	75.00	320.75	36,167.92	1,022.26	5,396.07	3,402.64	2,770.21	3,019.80	45,634.01
Jefferson.....	.....	.....	9,390.92	7,253.03	435.58	2,710.67	2.50	300.30	5330.49	60,836.07
Lewis and Clark.....	122.75	.....	.....	25,222.88	4,170.03	3,827.91	.....	224.29	59,251.30	403,487.40
Lincoln.....	69.80	43.10	4,897.43	24,724.53	624.70	2,911.78	3,982.11	43.55	41,337.37	298,421.34
Madison.....	.....	.....	10,692.25	15,775.02	576.95	2,994.50	.....	1,066.65	1,066.65	105,010.30
Meagher.....	100.50	26.50	6,496.10	19,923.66	522.19	4,385.95	175.00	36.35	1,170.47	52,283.72
Missoula.....	1,648.80	821.69	.....	38,531.08	1,355.86	3,326.43	.....	25.00	18,472.39	313,347.51
Musselshell.....	530.30	554.55	.....	15,470.13	130.21	820.18	761.55	14.99	37,886.00	106,830.22
Mineral.....	24.00	.....	7,239.35	1,231.43	1,398.49	.....	1,445.71	1,109.71	3,741.00	110,075.17
Park.....	1,400.35	859.80	1,447.66	23,340.23	664.34	8,046.42	.....	2,257.28	.....	38.00
Phillips (New County).....	1,041.30	944.28	6,877.67	21,232.83	622.68	4,086.77	1,445.71	1,018.00	.....	58,321.50
Powell.....	1,233.20	880.30	368.65	50,418.77	1,020.19	8,222.95	.....	209.28	4,894.43	8,894.43
Prairie (New County).....	44.50	.....	44.50	3,320.89	124.76	321.05	.....	1.20	1,558.00	261,464.75
Ravalli.....	63.00	273.50	11,224.60	26,053.03	1818.74	8,759.60	924.00	967.32	.....	22,149.66
Richland.....	405.00	125.40	.....	7,102.12	118.82	7,753.33	.....	5,577.99	35,582.79	216,212.38
Rosebud.....	231.50	43.50	.....	19,937.85	609.61	4,885.85	.....	14.00	26,764.06	106,310.66
Sanders.....	91.40	352.30	4,388.22	18,272.90	247.72	6,619.46	612.30	75.60	39,091.79	122,299.55
Sheridan.....	3,059.65	16.40	2,600.70	15,031.62	251.93	2,041.70	.....	379.37	25,299.55	179,842.96
Silver Bow.....	284.50	2,878.10	3,304.00	13,647.45	2,050.48	505.02	5,829.50	491.65	.....	47,261.12
Stillwater.....	5,158.00	5,158.00	22,000.80	67,002.33	3,692.78	8,204.36	1,976.56	2,039.58	3,616.12	180,783.09
Sweet Grass.....	363.50	120.00	1,707.25	12,766.14	193.50	5,066.61	1,976.56	442.42	6,427.83	12,160.44
Teton.....	42.00	15.00	4,005.35	11,217.71	860.63	7,418.38	1,000.00	21.40	1,435.40	61,370.60
*Toole.....	298.00	.....	.....	8,706.92	236.71	2,085.83	822.84	7,213.54	2,597.24	17,820.49
Valley.....	825.00	61.50	7,147.15	19,504.89	722.48	3,841.27	.....	2.00	32,401.15	208,686.80
Wilbux.....	65.80	.....	.....	6,311.90	88.02	56.54	1,761.57	4,007.10	.....	5,958,388.45
Yellowstone.....	837.30	13,272.47	489.50	21,125.37	999.71	2,335.51	50,217.57	51,522.84	669,010.97	
	29,265.85	32,036.67	192,346.28	999,115.87	50,227.10	202,616.08				



Table III.

## BRIDGE FUNDS

TOTALS OF MONEY RECEIVED AND PAID OUT DURING THE FISCAL YEAR ENDING NOVEMBER 30th, 1915, AND BALANCES ON HAND IN THE ROAD FUNDS OF THE COUNTIES OF MONTANA ACCORDING TO REPORTS OF COUNTY CLKRS

County	Balance 1914	Received 1915	Totals	Paid & Credited	Balance 1915	Warants Outstanding Dec. 1, 1914	Warrants Issued	Total	Redeemed & Charged	Warrants Outstanding Nov. 30, 1915
Beaverhead.....	\$ 7,511.57	\$ 15,312.56	\$ 22,824.13	\$ 13,461.91	\$ 9,362.22	\$ 1,209.26	\$ 12,034.88	\$ 13,244.14	\$ 13,239.14	\$ 5.00
Big Horn.....	7,008.43	37,395.86	44,404.29	37,222.50	7,181.79	4,944.14	32,330.90	37,275.04	36,781.71	493.33
Blaine.....	12,117.42	22,340.64	34,458.06	23,353.93	11,204.13	11,800.69	16,599.57	28,400.26	22,393.16	6,007.10
Broadwater.....	4,273.83	11,926.22	16,200.05	14,466.96	1,733.09	35.52	11,741.17	11,776.69	11,773.09	33.60
Carbon.....	18,897.26	18,897.26	37,794.52	19,381.49	18,413.03	3,116.80	27,093.43	20,210.23	19,377.72	832.51
Cascade.....	10,394.05	22,982.37	33,376.42	21,395.56	11,980.86	10.00	21,419.56	21,429.56	21,405.56	24.00
Chouteau.....	11,070.85	28,456.60	39,527.45	36,157.59	3,369.86	5,555.98	27,738.31	33,294.29	30,888.38	2,405.91
Custer.....	7,490.90	86,396.63	93,887.53	83,255.21	10,632.32	32,683.03	15,012.81	47,695.84	47,570.66	125.18
Dawson.....	1,988.27	21,556.47	23,544.74	17,226.67	6,318.07	4.00	15,012.81	17,484.00	17,493.50	9.50
Deer Lodge.....	16,512.59	2,543.77	19,056.36	16,302.54	2,753.82	6.40	5,485.42	5,491.82	5,302.54	189.28
Fallon.....	10,872.47	13,665.32	24,537.79	11,418.02	13,119.77	3,352.98	12,339.20	16,592.18	11,170.93	5,921.25
Fergus.....	35,595.74	91,434.96	127,030.70	80,170.67	37,860.03	63,707.35	14,441.85	78,149.20	71,477.69	6,671.51
Flathead.....	24,550.07	24,602.97	49,153.04	24,699.48	24,453.56	24,130.65	20,515.84	44,646.49	23,894.68	20,751.81
Gallatin.....	1,150.74	32,578.58	33,729.32	1,600.71	32,128.61	13.77	40,918.11	40,931.88	1,600.71	39,331.17
Groton.....	3,835.48	3,939.27	7,774.75	4,050.97	3,723.78	9,227.79	1,662.86	10,890.65	3,429.00	7,461.65
Hill.....	13,262.20	43,042.28	56,304.48	45,606.20	10,698.28	31,629.12	19,993.26	51,622.38	31,546.47	20,075.91
Jefferson.....	5,472.39	8,060.56	13,532.95	7,255.11	6,277.84	.....	7,255.11	7,255.11	7,255.11	.....
Lewis and Clark.....	2,655.64	80,079.87	82,735.51	74,976.18	7,759.33	44,333.56	52,092.62	96,436.18	72,587.26	23,838.92
Lincoln.....	10,949.71	22,515.40	33,465.11	21,853.70	11,611.41	18.00	30,508.56	30,526.56	21,831.28	8,695.28
Madison.....	11,990.00	12,065.24	24,055.24	13,069.56	10,985.68	.....	9,959.56	9,959.56	9,869.56	90.00
Meagher.....	11,962.24	3,188.53	15,150.77	11,187.79	3,962.98	.....	11,187.79	11,187.79	11,187.79	.....
Missoula.....	3,694.43	31,431.02	35,125.45	4,420.09	30,705.36	11.95	4,053.44	4,420.09	4,420.09	.....
Musselshell.....	9,633.50	32,387.23	42,020.73	23,785.18	18,235.55	16,617.91	9,053.44	25,671.35	21,674.36	3,996.99
Mineral.....	8,629.97	8,027.23	16,657.20	19,480.00	11,562.62	.....	185.89	185.89	185.89	.....
Park.....	20,791.34	20,791.34	29,421.31	18,558.40	10,862.91	.....	18,904.51	18,904.51	18,900.56	3.95
Phillips (New County).....	14,160.52	18,556.25	32,516.77	20,882.90	11,633.87	.....	3,903.33	18,882.90	18,882.90	3,903.33
Powell.....	14,333.37	15,704.75	30,038.12	18,147.05	11,891.07	42,576.64	13,104.05	55,680.69	15,749.80	39,930.89
Prairie (New County).....	6,842.05	19,838.26	26,680.31	16,872.50	9,807.81	6,761.52	7,756.34	13,518.86	6,836.62	6,682.24
Rosebud.....	32,082.82	115,058.25	147,141.07	119,966.46	27,174.61	104,406.95	13,819.90	118,226.89	107,886.29	10,340.60
Sanders.....	10,775.53	3,185.78	13,961.31	7,379.32	6,581.99	2.00	9,385.09	9,379.32	9,379.32	8.48
Sheridan.....	11,746.46	15,887.74	27,634.20	9,735.75	17,898.45	226.00	2,008.09	9,734.09	9,739.09	5.00
Silver Bow.....	25,799.63	33,525.58	59,325.21	34,379.93	24,945.28	241.51	221,145.78	22,987.29	22,062.49	334.80
Stillwater.....	9,977.17	37,970.09	47,947.26	42,467.26	4,780.00	4,829.45	38,403.23	43,332.66	41,961.26	1,371.40
Sweet Grass.....	5,643.82	5,776.06	11,419.88	4,866.78	6,553.10	.....	6,553.10	6,553.10	6,553.10	.....
Teton.....	1,319.32	4,060.07	5,379.39	4,415.00	964.39	.....	4,415.00	4,415.00	4,415.00	.....
Toole.....	14,605.47	56,845.71	71,451.18	48,015.49	23,435.69	.....	4,903.23	59,089.91	43,017.45	16,072.46
Valley.....	4,956.56	3,824.87	8,781.43	3,708.76	5,072.67	.....	7,708.76	7,708.76	2,708.76	.....
Wibaux.....	32,638.93	40,997.94	73,636.87	30,915.08	42,721.79	108.50	23,806.41	23,914.97	23,914.97	.....
Yellowstone.....	\$436,196.25	\$1,071,495.16	\$1,504,226.49	\$985,965.93	\$512,725.48	\$465,748.09	\$598,897.33	\$1,060,742.09	\$845,363.83	\$219,800.53

Table IV

## BRIDGE FUNDS

DETAILED TABULATION OF THE OPERATION OF THE GENERAL ROAD FUND.—EXPENDITURES FOR EACH COUNTY FOR THE YEAR ENDING NOVEMBER 30th, 1915.

County	Inspection and Viewing.....	Engineering....	Supervisors.....	Labor and Teams.....	Tools, Repairs and Replacements .....	Material.....	Contract Prices	Other Expenses.....	New Bridges....	Value Bridges...
Beaverhead.....	\$	\$	\$ 1,374.15	\$ 1,589.77	\$ 148.41	\$	\$	\$ 6.00	\$ 5,983.60	\$ 32,072.98
Big Horn.....	.....	.....	.....	526.82	.....	2,942.32	.....	.....	25,159.20	95,337.10
Blaine.....	.....	.....	.....	1,191.25	.....	1,199.35	.....	.....	12,813.72	57,254.73
Broadwater.....	15.00	30.00	.....	648.60	3.00	5,101.53	231.60	.....	6,170.17	34,265.47
Carbon.....	.....	.....	.....	532.00	.....	3,573.15	.....	426.30	2,164.41	111,253.45
Cascade.....	24.00	72.00	.....	58.69	.....	6,691.83	175.00	385.85	2,431.36	283,862.85
Chouteau.....	32.00	.....	1,110.50	6,985.98	8.75	2,690.63	8,758.62	17.88	12,264.85	55,987.85
Custer.....	.....	.....	.....	2,051.60	.....	3,464.25	1,815.90	694.94	16,148.80	321,408.42
Dawson.....	.....	.....	.....	1,382.79	.....	983.14	45.00	133.07	16,068.82	108,983.82
Deer Lodge.....	.....	.....	170.20	3,726.25	178.55	558.75	189.28	148.24	1,000.00	20,532.10
Fallon.....	38.00	60.00	46.75	2,250.31	1,599.31	8.00	.....	.....	11,929.99	34,825.66
Fergus.....	.....	.....	41.00	1,340.20	1,599.31	5,915.66	.....	63.50	7,943.44	140,639.12
Flathead.....	132.00	274.45	1,366.65	3,245.95	413.81	4,439.20	3,963.83	10.00	4,815.34	166,909.84
Gallatin.....	.....	.....	7,536.56	7,536.56	993.25	22,236.83	.....	332.22	13,677.56	211,210.38
Granite.....	.....	.....	.....	.....	.....	1,437.88	.....	.....	150.00	29,629.00
Hill.....	.....	5.00	.....	3,353.52	.....	955.51	.....	.....	15,208.73	64,516.79
Jefferson.....	.....	.....	.....	4,956.82	54.13	.....	.....	.....	7,232.55	31,982.55
Lewis and Clark.....	.....	.....	91.50	244.23	4.30	.....	25.00	.....	42,171.36	306,412.38
Lincoln.....	15.00	.....	.....	.....	.....	.....	.....	.....	28,895.49	132,360.00
Madison.....	.....	.....	.....	405.45	.....	1,070.61	.....	.....	9,835.50	93,405.50
Meagher.....	53.00	138.35	.....	824.67	148.96	1,896.25	188.66	.....	9,558.46	39,362.46
Missoula.....	8.00	21.00	85.50	.....	.....	1,769.50	366.09	23.00	8,388.50	247,874.95
Musselshell.....	.....	.....	.....	.....	.....	.....	.....	.....	3,986.26	84,110.48
Mineral.....	.....	.....	365.65	.....	.....	.....	.....	.....	.....	43,300.00
Park.....	37.50	.....	250.40	1,757.10	28.97	.....	643.65	137.40	12,273.86	123,959.15
Phillips (New County).....	.....	.....	.....	288.46	288.46	2,008.27	.....	.....	.....	.....
Powell.....	30.00	.....	20.00	1,155.62	1,155.62	2,417.70	292.00	18.00	11,758.54	.....
Prairie (New County).....	59.20	.....	44.50	2,255.35	1,155.62	4,131.59	680.70	1.84	1,033.67	.....
Ravalli.....	50.00	35.00	1,568.65	3,320.89	5.70	1.65	.....	20.00	5,653.55	66,914.05
Richland.....	.....	.....	.....	733.91	.....	4,756.95	.....	61.00	.....	22,648.18
Rosebud.....	.....	.....	.....	1,339.92	209.00	2,904.85	.....	.....	9,418.60	312,056.60
Sanders.....	91.40	352.30	4,388.22	1,622.50	247.22	2,666.40	612.30	245.00	.....	140,999.60
Sheridan.....	.....	.....	.....	18,272.20	247.22	6,619.46	.....	75.60	13,517.59	87,719.14
Stillwater.....	.....	.....	.....	393.60	108.25	2,874.88	.....	93.65	1,961.15	17,561.15
Silver Bow.....	236.00	767.24	136.60	40.00	8.50	87.00	830.80	.....	31,350.90	122,125.92
Stillwater.....	41.00	5.00	.....	1,928.47	8.50	9,314.79	4,333.00	246.25	4,380.00	75,280.00
Sweet Grass.....	.....	.....	.....	121.15	23.31	2,836.50	.....	138.12	4,590.75	72,775.75
Teton.....	.....	.....	.....	.....	.....	.....	.....	.....	1,236.53	16,242.57
*Toole.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	135,662.55
Valley.....	76.34	.....	74.00	359.75	.....	4,400.24	.....	.....	2,603.76	8,703.76
Wibaux.....	.....	.....	.....	105.00	.....	.....	1,317.71	45.00	64,118.13	301,889.74
Yellowstone.....	.....	3.00	.....	221.65	.....	907.57	.....	.....	.....	.....
	2,312.59	1,763.94	11,057.77	70,878.98	3,299.20	103,899.77	24,498.54	3,372.86	417,902.25	4,250,306.03

Table V

## ROADS AND BRIDGES

MISCELLANEOUS TABLES OF VALUATIONS.—EXPENDITURES NOT CLASSIFIED.—1915.

County	Roads	Bridges	Tools & Machinery	County Surveyor	Total Valuation for Taxation	Outstanding Road Bonds	Outstanding Bridge Bonds	Tax Levies Refunding	Mills Road Levy	Mills Bridge Levy
Beaverhead...	\$ 72,228.95	\$ 32,072.98	\$ 7,543.66	\$ 1,933.98	\$ 9,921,164.00	\$ .....	\$ 28,500.00	\$ 80,000.00	1 1/2	1 1/2
Big Horn.....	32,142.15	95,327.10	1,482.50	1,956.56	5,494,909.00	40,000.00	.....	63,000.00	1 1/2	1 1/2
Blaine.....	1,382.74	.....	6,472.34	3,682.01	5,587,686.00	62,000.00	.....	95,000.00	2	2
Broadwater.....	51,536.73	34,265.47	2,572.34	1,136.70	4,260,871.00	.....	.....	82,000.00	1	1
Carbon.....	120,652.06	283,862.85	9,196.62	3,699.63	8,123,747.00	.....	22,000.00	252,000.00	5	5
Cascade.....	221,530.30	253,862.85	14,574.17	4,673.14	31,449,393.00	.....	45,000.00	267,000.00	3	3
Chouteau.....	108,064.27	351,967.85	20,576.83	7,762.00	9,105,443.00	.....	220,000.00	314,000.00	1 1/2	1 1/2
Custer.....	278,374.04	321,408.42	10,532.45	1,916.35	14,272,833.00	.....	.....	100,000.00	5	5
Dawson.....	49,421.70	108,963.82	11,582.33	1,278.15	10,554,401.00	.....	.....	115,000.00	5	5
Deer Lodge.....	111,044.85	20,582.10	6,527.70	19.60	9,838,341.00	.....	.....	275,000.00	5	5
Fallon.....	135,000.00	34,525.66	3,567.78	2,608.15	8,451,930.00	.....	.....	225,000.00	5	5
Fergus.....	372,738.73	140,939.12	11,648.00	8,892.98	20,910,585.00	.....	52,500.00	232,000.00	5	5
Flathead.....	523,221.07	166,909.84	33,498.19	8,950.03	12,874,107.00	.....	.....	150,000.00	5	5
Gallatin.....	414,941.75	211,210.38	29,151.52	2,832.07	16,724,404.00	.....	.....	150,000.00	4	4
Granite.....	164,462.52	29,929.00	1,436.70	1,038.80	8,881,090.00	.....	.....	42,000.00	1	1
Hill.....	45,634.01	64,516.19	30,664.08	5,245.40	9,247,436.00	.....	.....	150,000.00	1	1
Jefferson.....	60,836.07	31,982.55	3,100.50	2,706.18	6,215,035.00	.....	.....	205,000.00	3	3
Lewis and Clark.....	403,487.40	306,412.36	23,323.41	2,706.18	24,151,849.00	*125,000.00	.....	156,000.00	5	5
Lincoln.....	298,421.34	132,360.00	8,249.55	661.65	6,215,569.00	.....	.....	30,000.00	4	4
Madison.....	106,010.30	93,405.50	4,464.30	2,209.44	11,084,129.00	.....	.....	160,000.00	4	4
Meagher.....	52,283.72	39,362.46	4,045.67	1,769.36	16,123,572.00	.....	.....	142,379.64	3	3
Missoula.....	313,347.31	247,874.95	25,494.97	1,869.00	4,135,117.00	.....	150,000.00	37,000.00	4	4
Musselshell.....	106,830.22	84,110.48	5,123.19	1,292.96	3,614,799.00	.....	.....	135,000.00	5	5
Mineral.....	110,075.17	43,300.00	5,619.35	1,642.39	10,885,589.00	.....	.....	36,000.00	4	4
Park.....	131,878.60	123,993.15	8,967.32	4,493.18	7,346,760.00	*50,000.00	.....	60,000.00	2 3/4	2 3/4
Phillips (New County).....	58,321.50	59,103.96	8,093.67	826.35	7,346,760.00	.....	.....	55,000.00	3	3
Powell.....	163,553.67	163,553.67	3,211.35	845.12	1,088,843.00	.....	.....	175,000.00	5	5
Prairie (New County).....	8,894.43	66,914.05	8,217.02	27.02	7,192,264.00	.....	.....	377,000.00	2	2
Ravalli.....	261,464.75	66,914.05	3,746.80	4,277.95	1,544,436.00	.....	.....	53,000.00	5	5
Richland.....	22,149.66	22,648.18	10,202.99	3,277.97	12,883,017.00	.....	72,000.00	19,962.06	4	4
Rosebud.....	216,212.38	312,066.60	2,487.50	8,682.95	6,044,324.00	132,000.00	.....	377,000.00	4	4
Sanders.....	240,601.60	140,999.60	2,483.90	6,132.45	10,599,544.00	.....	.....	270,000.00	2	2
Sheridan.....	106,310.66	17,591.15	12,823.28	2,117.52	4,219,268.00	.....	.....	85,000.00	5	5
Silver Bow.....	122,299.55	122,299.55	18,163.40	2,816.22	6,228,499.00	.....	85,000.00	60,000.00	3.5	3.5
Stillwater.....	179,842.96	122,125.93	1,409.25	1,276.54	5,279,076.00	*100,000.00	.....	77,000.00	4	4
Sweet Grass.....	47,261.12	73,280.00	1,867.98	8,066.18	12,419,568.00	.....	65,000.00	293,000.00	3	3
Teton.....	180,783.09	72,715.75	17,918.95	3,919.25	4,300,412.00	.....	.....	38,000.00	5	5
*Toole.....	12,160.44	16,242.57	6,327.88	4,197.00	5,442,036.00	.....	.....	45,000.00	2	2
Valley.....	61,370.60	135,662.55	6,327.88	12,013.41	20,331,859.00	.....	112,000.00	287,000.70	161 3/4	54 11-20
Wibaux.....	17,820.49	8,703.75	737.70	.....	.....	509,000.00	865,000.00	.....	.....	.....
Yellowstone.....	208,666.80	301,889.74	26,516.08	.....	.....	.....	.....	.....	.....	.....
	5,832,593.47	4,327,989.79	409,877.45	\$132,660.01	\$439,785,918.00	509,000.00	865,000.00	287,000.70	161 3/4	54 11-20





